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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/030,153	01/29/2002	Byunghong Kim	KIMB3006/REF	6343

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BACON & THOMAS, PLLC
625 SLATERS LANE
FOURTH FLOOR
ALEXANDRIA, VA 22314

EXAMINER	
DOVE, TRACY MAE	
ART UNIT	**PAPER NUMBER**
1745	

DATE MAILED: 07/16/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/030,153	KIM ET AL.	
	Examiner	Art Unit	
	Tracy Dove	1745	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *11 May 2004*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-4* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-4* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

This Office Action is in response to the communication filed on 5/11/04. Applicant's arguments have been considered, but are not persuasive. Claims 1-4 are pending and remain rejected in view of the prior art. This Action is made **FINAL**.

Claim Objections

The objections to the claims have been withdrawn.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1-4 are rejected under 35 U.S.C. 102(e) as being anticipated by Kim et al., US 5,976,719.

Kim teaches a biofuel cell having an anodic compartment and a cathodic compartment. The anodic compartment contains an anode and a conductive media and the cathodic compartment contains a cathode and a conductive media. The anodic compartment and the cathodic compartment are separated by an ion exchange membrane (Figures 1-2; col. 5, lines 49-62; claim 1). The electrolyte for the cathode is kept in an oxygen-saturated state by continuously feeding air to the cathode compartment. The electrolyte for the anode is maintained in an anaerobic condition by feeding nitrogen gas, from which oxygen has been completely removed, to the anode compartment (col. 6, lines 16-34). The anodic compartment contains wastewater

and sludge (col. 6, lines 59-67; Example 1). The wastewater/sludge may be collected from various locations including a rice paddy field (starch), the bottom soil of a river or a septic tank of a sewage treatment works (col. 7, lines 16-19). The wastewater/sludge was cultured under anaerobic conditions (col. 7, lines 38-39). The microorganism is used as a microbial catalyst (col. 3, lines 30-34). Electrical energy is generated by the biofuel cell (col. 1, lines 5-10).

Thus the claims are anticipated.

Response to Arguments

Applicant's arguments filed 5/11/04 have been fully considered but they are not persuasive.

Applicant argues that in contrast to Kim, the presently claimed invention relates to a biofuel cell comprising an anode compartment wherein sludge and wastewater is added to the anode compartment. Examiner disagrees with Applicant's analysis of Kim. Specifically, Kim teaches a biofuel cell having an anodic compartment and a cathodic compartment. The anodic compartment contains an anode and a conductive media and the cathodic compartment contains a cathode and a conductive media. The anodic compartment of Kim contains wastewater and sludge (col. 6, lines 59-67; Example 1). The wastewater/sludge may be collected from various locations including a rice paddy field (starch), the bottom soil of a river or a septic tank of a sewage treatment works (col. 7, lines 16-19). Applicant further argues Kim does not teach culturing the sludge or waste water. However, Kim teaches the wastewater/sludge was cultured under anaerobic conditions (col. 7, lines 38-39). Note the instant specification discloses "electrochemically active microorganisms . . . are inherently present in various wastewaters" (page 4, lines 15-16). Thus, Kim teaches culturing electrochemically active bacteria present in

the sludge/wastewater. Both the biofuel cell of Kim and the biofuel cell of the claimed invention produce electric current (page 4, lines 19-23 of instant specification).

Applicant argues Kim "is provided for the purpose of generating an electric current without an electron transfer mediator", however, the present invention provides "a biofuel cell that is capable of purifying wastewater while producing electricity by carrying out an efficient electrode reaction using a variety of wastewaters and sludges *without using an electron transfer mediator*" (page 4, lines 19-23).

In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., kind of microorganisms) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

Applicant argues there is a difference in the basic structure of the biofuel cell of Kim and the biofuel cell of the claimed invention. However, Applicant does not provide arguments regarding differences in the structures of the two biofuel cells. Applicant attempts to compare the microorganism of Kim with the sludge/wastewater limitation of the claimed invention. This comparison is improper because the microorganism is contained in the wastewater of Kim. Kim clearly teaches the anodic compartment contains wastewater and sludge (col. 6, lines 59-67; Example 1). The wastewater/sludge may be collected from various locations including a rice paddy field (starch), the bottom soil of a river or a septic tank of a sewage treatment works (col. 7, lines 16-19). Kim teaches the wastewater/sludge was cultured under anaerobic conditions (col. 7, lines 38-39). Note the instant specification discloses "electrochemically active

microorganisms . . . are inherently present in various wastewaters" (page 4, lines 15-16). Thus, Kim teaches culturing electrochemically active bacteria present in the sludge/wastewater. Furthermore, Applicant attempts to compare the catalyst of Kim with the wastewater fuel of the claimed invention. This comparison is improper because the catalyst and the initial fuel are separate components. Kim clearly teaches wastewater is utilized as a fuel in the biofuel cell (abstract). The present specification teaches "the biofuel . . . is operated using the densely cultured microorganisms, as a catalyst, and organic substances present in wastewater, as a fuel". Kim clearly teaches a wastewater fuel and a catalyst (see above). Note claims 1-3 do not contain any limitations regarding a catalyst.

Applicant points out Kim uses at least one material selected from pyruvate, lactate and citric acid. In contrast, the biofuel cell of the claimed invention used wastewater alone without a particular fuel. It is unclear what Applicant is attempting to argue. Kim clearly teaches the anodic compartment contains wastewater and sludge (col. 6, lines 59-67; Example 1). The wastewater/sludge may be collected from various locations including a rice paddy field (starch), the bottom soil of a river or a septic tank of a sewage treatment works (col. 7, lines 16-19). Kim teaches the wastewater/sludge was cultured under anaerobic conditions (col. 7, lines 38-39). Kim clearly teaches wastewater is utilized as a fuel in the biofuel cell (abstract). Furthermore, Kim teaches pyruvate and lactate are electron donors (Table 1). The present invention teaches lactic acid is an electron donor (Table 1). Note the claims do not require "wastewater alone" as the fuel because the claims recite "comprising" and "containing" (not "consisting of") when describing the biofuel cell and/or anodic compartment.

Regarding Applicant's arguments on page 7 of the amendment, both Kim and the present invention utilize bacteria contained in wastewater or organic substances. See discussion above regarding Kim and the present invention. Applicant's arguments regarding Kim do not reflect the teachings of Kim. Examiner suggests Applicant point out the specific sections of Kim that Applicant believes distinguishes the claimed invention over Kim. Examiner requests Applicant point out where Kim teaches the microorganism needs to be frequently replaced or repaired, as asserted by Applicant. Furthermore, Applicant should clearly point out how Kim differs from the claimed invention.

In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., operation time of the fuel cell) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

Applicant argues since the biofuel cell of the claimed invention does not use a separate electron transfer mediator, it is economically advantageous over Kim. Again, the comparison of teachings of Kim with the claimed invention is improper because Kim teaches a mediator-less biofuel cell (see the title).

Thus, Applicant's arguments are not persuasive.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tracy Dove whose telephone number is 571-272-1285. The examiner can normally be reached on Monday-Thursday (9:00-7:30).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Pat Ryan can be reached on 571-272-1292. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

July 15, 2004

Patrick Ryan
Supervisory Patent Examiner
Technology Center 1700